भारतीय मानक
Indian Standard

IS 13258 : 2014
(Reaffirmed 2019)

अल्प दाब द्रवणीय गैसों के लिए 5 लिटर से अधिक जल क्षमता वाले वेल्डित अल्प कार्बन इस्पात के सिलिंडर — उपयोग किये गये एलपीजी सिलिंडरो के पुनर्वीयन और निरीक्षण की अपेक्षाये

(पहला पुनरीक्षण)

Welded Low Carbon Steel Cylinders Exceeding 5 Litre Water Capacity for Low Pressure Liquefiable Gas — Requirements for Inspection and Reconditioning of Used LPG Cylinders

(First Revision)

ICS 23.020.30; 75.160.30

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Gas Cylinders Sectional Committee, MED 16

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Gas Cylinders Sectional Committee had been approved by the Mechanical Engineering Division Council.

This Standard was first published in 1991 and revision is taken to align it with the latest technological advancement and the practice being followed in the country for the re-conditioning of LPG cylinders.

This standard covers examination, reconditioning and the criteria for declaring an used LPG cylinder unserviceable. Manufacture, possession and use of any gas, when contained in cylinders of more than 500 ml water capacity in a compressed or liquefied state, are regulated under the *Gas Cylinder Rules*, 2004, of the Government of India. This standard has been formulated in consultation and agreement with the statutory authorities under those rules.

For the convenience, it is divided into following two sections:

Section 1 Inspection
Section 2 Detailed examination and reconditioning

In the revision of this standard following major changes has been done:

a) Title modified earlier it was 'code of practice' now 'requirement standard'.
b) Clause **6** for external examination has been modified and more details are provided regarding the rejection criteria in the tabulated form.
c) New Clause **4** 'General' has been added.
d) Clause for dedenting is removed, that is dedenting not permitted.
e) Clause **12** Heat treatment modified.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

WELDED LOW CARBON STEEL CYLINDERS EXCEEDING 5 LITRE WATER CAPACITY FOR LOW PRESSURE LIQUEFIABLE GAS — REQUIREMENTS FOR INSPECTION AND RECONDITIONING OF USED LPG CYLINDERS

(First Revision)

1 SCOPE

This standard lays down the requirements for the inspection, materials, procedure, testing and marking for reconditioning of used LPG cylinders manufactured as per IS 3196 (Part 1) : 2006 'Welded low carbon steel cylinders exceeding 5 litre water capacity for low pressure liquefiable gases : Part 1 Cylinders for liquefied petroleum gases (LPG) — Specification (*fifth revision*)' of capacity exceeding 5 litre and up to and including 250 litre.

This standard is not applicable for periodic inspection and testing of LPG cylinders.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions to this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 7241 : 1981 'Glossary of terms used in gas cylinder technology' and the following shall apply.

3.1 Competent Person — A person appointed by the testing agency and who by a combination of training, experience and supervision is able to make objective judgments on a subject.

3.2 Gross Weight — The sum of the tare weight of cylinder and the maximum weight of the LPG permitted in it.

3.3 Manufacturer — Means approved LPG cylinder manufacturer under gas cylinder rules.

3.4 Owner — The owner means the oil company who owns LPG cylinder.

3.5 Pit — A local corrosion not in excess of 6 mm diameter and occurring not more frequently than one in any 500 mm^2 of the surface.

3.6 Rejection — Putting cylinder out of service until finally deshaped.

3.7 Repairer — Any agency having facilities and capabilities to carry out the reconditioning of used LPG cylinder as per the standard.

SECTION 1 INSPECTION

4 GENERAL

The details of Inspection and reconditioning, shall be submitted by the repairer to the inspecting authority for final approval by statutory authority.

5 INSPECTION EQUIPMENT AND METHOD OF MEASUREMENT

Exterior corrosion, denting, bulging, gouges or digs are normally measured by simple direct measurement with scales or depth gauges. The defect can also be measured using a rigid straight edge of sufficient length placed over the defect and a scale is used to measure the distance from the bottom of the straight edge to the bottom of the defect. Suitable depth gauges may also be used for measuring the depth of small cuts or pits. When measuring cuts, the upset metal shall be removed or compensated for so that only actual depth of metal removed from the cylinder wall is measured.

6 EXTERNAL EXAMINATION

6.1 External Inspection

The entire surface shall be inspected by a competent person for,

a) dents, cuts, gouges, bulges cracks, laminations or punctures, bottom shell thickness, foot ring bottom clearance applying the criteria for rejection given in Table 1.

Table 1 Physical Defects in the Cylinder Wall

[*Clause* 6.1(a)]

Sl No. (1)	Defects (2)	Description (3)	Rejection Criteria (4)
i)	Bulge	Visible swelling of the cylinder	Rejection in all cases
ii)	Dent	Depression in the cylinder that has neither penetrated nor removed the metal	a) Depth of dent is greater than 1/10th of the mean diameter of the dent, or b) Mean diameter of the dent is greater than one-quarter of the diameter of cylinder, or c) Dent on or adjacent to weld
iii)	Cut or gouge	Sharp impression where metal has been removed or redistributed	75 mm or more in length or when the depth of cut is such that the undamaged (remaining) wall thickness is less than the minimum calculated wall thickness
iv)	Intersecting cut or gouge	Point of intersection of two or more cuts or gouge	Rejection in all cases
v)	Dent containing cut or gouge	Depression in the cylinder within which there is cut or gouge	When the size of dent or cut or gouge exceeds the dimension for rejection as an individual defect
vi)	Crack	A split or rift in the cylinder shell	Rejection in all cases
vii)	Lamination	Layering of the material within the cylinder wall appearing as a discontinuity, crack. Lap or bulge at the surface	Rejection in all cases
viii)	Dig	A sharp depression where the surface material has been penetrated	75 mm or more in length and 4 mm or more in width
ix)	Bottom shell thickness	Thickness of the bottom of the cylinder surface	Less than minimum calculated wall thickness[1)]
x)	Footring bottom clearance	Clearance of the body bottom from the ground.	a) Less than 8 mm for cylinders of water capacity up to 34 litre b) Less that 15 mm for cylinders of water capacity exceeding 34 litre and up to 50 litre c) Less than 25 mm for cylinders of water capacity exceeding 50 litre

[1)] Cylinders shall be rejected in case the observed thickness of the undamaged remaining wall in the affected portion is less than the minimum calculated wall thickness.

Table 2 Corrosion Defects in the Cylinder Wall

[*Clause* 6.1(b)]

Sl No. (1)	Defects (2)	Description (3)	Rejection Criteria (4)
i)	Isolated corrosion pits	Pitting of metal occurring in isolated areas at a concentration not greater than 1 pit / 500 mm^2 of surface area	Depth of penetration of any pit exceeds 0.4 mm[1)]
ii)	Area corrosion	Reduction in wall thickness over an area not exceeding 20 percent of the cylinder surface including the ends (top and bottom)	Depth of penetration of any pit exceeds 0.4 mm[1)]
iii)	General corrosion	Reduction in wall thickness over an area exceeding 20 percent of the cylinder surface	Rejection in all the cases
iv)	Line corrosion	Series of pits or corroded cavities of limited width along the length or around corrosion circumference	a) Total length of corrosion in any direction exceeds 50 percent of the circumference of the cylinder b) Depth of penetration exceeds 0.4 mm[1)] c) Depth of corrosion cannot be measured
v)	Cervice corrosion	Cervice corrosion occurs in the area of the intersection of the footring or stay plate with the cylinder	When the depth of penetration exceeds 0.4 mm or when the depth of corrosion cannot be measured[1)]

[1)] Cylinders shall be rejected in case the observed thickness of the undamaged remaining wall in the affected portion is less than the minimum calculated wall thickness.

Table 3 Other Defects
[*Clause* 6.1(c)]

Sl No. (1)	Defects (2)	Description (3)	Rejection Criteria (4)
i)	Depressed bung	Damage to the bung which alters the profile of the cylinder	Rejection in all cases
ii)	Arc or torch burns	Burning of the cylinder base metal, a hardened heat affected zone, the addition of extraneous weld metal, or removal of metal by scarping or cratering	Rejection in all cases
iii)	Fire damage	Excessive general or localised heating of the cylinder usually indicated by: a) Charring or burning of paint[1)] b) Fire damage of the metal c) Distortion of the cylinder d) Melting of metallic valve parts e) Melting of safety cap	Rejection in all cases

[1)] In case of superficial charring of paint cylinder may be accepted.

b) corrosion, giving special attention to areas where water can be trapped, at the base of the cylinder, the junction between the body and the footring, the junction between the body and valve guard or shroud, applying the criteria for rejection given in Table 2.

c) other defects (for example, depressed bung or fire damage), applying the criteria for rejection given in Table 3.

Any cylinder rejected by the competent person shall be segregated in accordance with **11.1**.

SECTION 2 DETAILED EXAMINATION AND RECONDITIONING

7 DE-GASSING OF CYLINDERS

7.1 Cylinder shall be degassed by suitable method and each cylinder shall be checked to ensure complete degassing. The de-gassing station and procedures shall have the approval of the statutory authority.

7.2 Valves of cylinders taken for processing shall be removed by employing a proper fixture and a suitable wrench using a close fitting hexagonal adopter. It shall be ensured that only depressurised cylinders are taken for the removal of the valve.

8 MATERIAL

The material used for manufacturing the replacements of detachables like shroud, valve protection ring and footring shall be as specified in IS 3196 (Part 1). The tube used for making valve protection ring shall conform to the owner's requirement as detailed in their drawing.

9 REPLACEMENT DETACHABLES

9.1 The design of all detachables shall meet the requirements laid down in IS 3196 (Part 1) for individual parts respectively and shall be in line with the approved drawing of owner.

9.1.1 The design shall conform to the owner's requirement as detailed in their drawing.

9.1.2 The straightness and verticality of finished cylinders shall be as per IS 3196 (Part 1).

9.1.3 The eccentricity of the welded VP ring shall be as per IS 3196 (Part 1).

9.1.4 The foot ring shall be fitted as per IS 3196 (Part 1).

10 DETAILED EXAMINATION

10.1 Cylinders received for reconditioning shall be examined in accordance with Section 1.

10.2 External Cleaning

Each cylinder shall be cleaned externally by wire brushing, water jet abrasive cleaning, approved chemical cleaning or any other suitable method.

10.3 Internal Cleaning

Each cylinder shall be internally cleaned by any of the following methods.

10.3.1 Where the interior of the cylinder is contaminated by oil or other similar fluid it shall be cleaned by one of the following methods:

a) Steam cleaning;
b) Washing out with an approved solvent; and
c) Use of magnet to remove metallic parts.

10.3.2 Where the interior of a cylinder is affected by rust or other foreign matter it shall be cleaned by one of the following methods:

a) Approved blasting, rotary wire brushing or rumbling procedure; or
b) Burnt out treatment in a furnace not exceeding temperature of the cylinder to more than 300°C for a period not exceeding 1 h since overheating could change the mechanical properties of the cylinder. After this all free rust and scale shall be removed by methods as given in **10.3.1**.

10.4 Tare Weight Verification

After degassing and through cleaning (internally and externally), cylinders shall be checked for correct determination of the tare weight (weight of the empty cylinder with valve and its safety cap, footring and V.P. ring). Any cylinder having lost its tare weight by over 5 percent of its original tare weight shall be declared unserviceable.

10.5 External Inspection

10.5.1 Affected portions of the body of the cylinders segregated during inspection under Section 1 shall be ground to achieve a defect free surface.

10.5.1.1 Cylinder wall thickness so achieved shall not be less than minimum calculated wall thickness as per IS 3196 (Part 1).

10.6 Internal Inspection

The entire internal surface of the cylinder shall be examined by means of an extra low voltage inspection lamp and the cylinder shall be declared unserviceable, if the bottom of an internal defect cannot be seen and its extent cannot be measured.

11 SEGREGATION OF CYLINDERS

Cylinders on the basis of inspection shall be segregated in accordance with **11.1** and **11.2**.

11.1 Unserviceable

Cylinders with any one or more of the following conditions shall be declared unserviceable:

a) Cylinders declared unserviceable when inspected according to Section 1;
b) Cylinders having lost their identity (Manufacturer's name, serial number of the cylinder, test date and original tare weight);
c) Cylinders coming for repairs for the second time; and
d) The cylinders having wall thickness less than the minimum thickness as permitted in **10.5.1.1**.

Cause(s) of rejection of all the unserviceable cylinders shall be recorded in the performa as shown in Annex B and cause may be coded in the following manner:

Bulge : E-1
Burn : E-2
Dent : E-3
Dig : E-4
Cut : E-5
Pit : E-6
Line corrosion : E-7
General corrosion : E-8
Bung thread damage : E-9
Loss in tare weight : E-10
Identity lost : E-11
Cylinder identified as once repaired : E-12
The bottom of internal defect cannot be seen and it's extent cannot be measured : I-1
The wall thickness has been reduced by more than the specified value : I-2

11.2 Repairable

Cylinders which are found serviceable according to **10.1** and **11.1** shall be considered repairable. These cylinders shall be taken for further processing and reconditioning. When repaired, both the footring as well as the V P ring shall be replaced.

12 RE-CONDITIONING

12.1 Removal of Footring and Valve Protecting Ring

12.1.1 Foot ring and valve protecting ring shall be removed without damaging the body of the cylinder. The welded spots shall be ground and cleaned thoroughly for checking the surface for line corrosion, pits, etc, and wall thickness before fitting new footring and valve protecting ring.

12.2 Fixing New Footring and Valve Protecting Ring/Shroud

New footring and valve protecting ring/shroud shall be welded in accordance with IS 3196 (Part 1) and all welds shall be inspected for weld defects.

13 HEAT TREATMENT

13.1 Cylinders shall be efficiently and uniformly stress relieved as approved by the statutory authority after completion of welding of attachments and before hydrostatic test is applied. A complete record of the heat treatment cycle shall be maintained.

13.2 Localized heat treatment shall not be permitted.

NOTE — The stress relieving cycle shall be qualified as in manufacturing of the cylinder variety being subjected to the process.

14 HYDROSTATIC TEST

14.1 Each heat treated cylinder shall be subjected to hydrostatic test. During the hydrostatic test, the pressure shall be increased gradually till the required test pressure is reached. After the test pressure is reached and the external surfaces of the cylinder are dried, it shall be retained for a period of not less than 30 s. Any reduction in pressure noticed during this retention period or any leakage or visible bulge or deformation shall be treated as a case of failure in the test and the cylinder shall be declared unserviceable.

14.1.1 The value of hydrostatic test pressure for LPG shall be taken as 25 kgf/cm^2 as specified in IS 3196 (Part 1).

14.1.2 Hydrostatic test shall be carried out as per IS 3196 (Part 3).

15 FIXING OF VALVE

15.1 Valve Connection

Prior to fitting the valve, the bung threads shall be cleaned using a machine tap of the same thread profile as the bung threads. The cleaning shall ensure freedom from grit, zinc and other foreign matter, if any. Also it shall ensure, breaking of scale formed on the thread and re-correction of any distortion, experienced during heat treatment.

Valve suitable for intended use and conforming to IS 8737 shall be fitted to the cylinder using approved jointing compound at the torque of 200 ± 20 Nm, after ensuring that internal cleaning of the cylinder has been done for removal of any water, grit, welding slag, flux, metal or any other foreign particles.

16 PNEUMATIC TEST

16.1 Each cylinder after it has been dried and fitted with valve shall be tested for leakage by subjecting to air pressure of not less than 12 kgf/cm^2 a period of 1 min while immersed in water and shall show no leakage from the body of the cylinder and the joint between valve and bung. This test shall be carried out after fixing the safety cap on the valve.

16.2 Pneumatic leakage test shall be carried out as per IS 3196 (Part 3).

NOTE — Suitable air drying methods may be adopted as long as they ensure no condensate is present in the cylinders.

17 DE-SHAPING

Cylinders declared unserviceable during inspection/ tests shall be de-shaped as per *Gas Cylinder Rules*, 2004.

18 PREPARATION FOR DESPATCH

18.1 All cylinders shall be thoroughly cleaned and dried internally before being fitted with valves.

18.2 The outside surface shall be grit (*see* IS 4683) blasted with minimum SA 2.5 grade of blast (*see* IS 9954) and shall be given following protective coatings:

a) Spraying zinc to give a coating of minimum thickness of 37 µ unless otherwise agreed to between the purchaser and the manufacturer. The zinc wire used for spraying shall be as per IS 12447 and the zinc spraying shall be as per IS 6586.
b) One coat of zinc chromate primer as agreed to between the purchaser and the manufacturer.
c) One coat of synthetic enamel paint conforming to IS 2932 of signal red colour (Shade No. 537 of IS 5) or any other colour with the approval of statutory authority.
d) As an alternate to (a), (b) and (c) cylinders shall be powder coated (*see* IS 13871) or stoving primer coated (*see* IS 2074) and enamel coated (*see* IS 2932) as per the agreement between the repairer and the owner.

The total minimum combined coating thickness shall be 67 µ.

NOTE — Procedure for measurement of coating of thickness:

a) Five gauge readings for each spot shall be taken moving the probe a short distance for each new gauge reading within an approximate area of 2 cm × 2 cm, Discard any unusually high or low gauge reading that cannot be repeated consistently. Take the average of the five gauge readings as a spot measurement.
b) Make five such spot measurements approximately evenly spaced over the surface of the cylinder.
c) Each spot measurement shall not be below 80 percent of the specified minimum thickness and average of the five spot measurements shall not be below the specified thickness.

19 RECORDS

A record shall be maintained for all tests, reconditioning and inspections at the cylinder repairer's works and copies shall be made available to the inspecting authority and owner of the cylinder, if desired. A test certificate duly approved and signed by the inspecting authority shall be forwarded to the statutory authority and the owner (*see* Annex C).

20 MARKINGS

20.1 The cylinders fitted with new footring and V. P. ring shall be immediately marked with the following original markings on the footring and vertical stays of V. P. ring as applicable:

a) Original serial number and batch number of the cylinder;
b) Original BIS certification mark and manufacturer's name or its initials;
c) Repairer's identification/ initials/monogram;
d) New tare weight and gross weight of cylinder, in kg;
e) Month and year of manufacture, retest and reconditioning;
f) The maximum working pressure, test pressure, in MPa;
g) Water capacity, in litres;

h) Loss in tare weight, if observed under **10.4** shall be punched at the footring (Example, If the loss in tare weight is 200 g, it shall be punched as LTW 200); and

j) BIS certification Mark and CM/L number of repairer on the foot ring.

The letter 'R' shall be conspicuously stamped on the vertical stay of the valve protecting ring as close to certification mark as practicable for identification that the cylinder is reconditioned. The letter 'R' shall be stamped on the footring also.

20.2 BIS Certification Marking

The details available with the Bureau of Indian Standards.

20.2.1 The use of the Standard Mark is governed by the provisions of *the Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted for the process to the repairer may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
5 : 2007	Colours for ready mixed paints and enamels (*sixth revision*)
2074 : 1992	Ready mixed paints, air drying, red oxide zinc crome, priming — Specification (*second revision*)
2932 : 2003	Enamel, synthetic, exterior, undercoating, (b) finishing — Specification (*third revision*)
3196 (Part 1) : 2006	Welded low carbon steel cylinders exceeding 5 litre water capacity for low pressure liquefiable gases — Cylinders for liquefied petroleum gases (LPG) — Specification (*fifth revision*)
(Part 3) : 2011	Methods of test (*fifth revision*)
4683 : 1968	Pictorial surface preparation standards for painting steel surfaces
6586 : 1989	Recommendation practice for metal spraying for protection of iron steel (*first revision*)
7241 : 1981	Glossary of terms used in gas cylinder technology (*first revision*)
8737 : 1995	Valves fittings for use with liquefied petroleum gas (LPG) cylinders of more than 5 litre water capacity (*first revision*)
9954 : 1981	Pictorial surface preparation standards for painting of steel surfaces
12447 : 1988	Zinc wire for sprayed zinc coatings
13871 : 1993	Power coatings — Specification

ANNEX B

(*Clause* 11.1)

LIST OF CYLINDERS UNSERVICEABLE

Repairer's name :
Order No. :
Batch No. :
Certificate No. :
Date :

Cylinder Sl No.	*Original Manufacturer's Name*	*Date of Manufacture*	*Date of Rejection*	*Cause of Rejection*

Repairing company's representative

Inspecting officer

ANNEX C

(*Clause* 19)

LIST OF CYLINDERS ACCEPTED

Repairer's name :
Order No. :
Batch No. :
Certificate No. :
Date :

Cylinder Sl No.	*Original Manufacturer's Name*	*Date of Manufacture*	*Date of Repair/Test*	*Details of Repairs Carried Out*

Repairing company's representative

Inspecting officer

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Gas Cylinders Sectional Committee, MED 16

Organization	*Representative*(*s*)
Petroleum and Explosive Safety Organization, Nagpur	Shri T. R. Thomas (***Chairman***) Shri D. K. Gupta (*Alternate*)
All India Industrial Gases Manufacturers Association, New Delhi	Shri Saket Tiku Shrimati Veena Peter (*Alternate*)
Bharat Petroleum Corporation Ltd, Mumbai	Shri Vishnu D. Sonawane Shri Sanjay Phulli (*Alternate*)
Bharat Pumps and Compressors Ltd, Allahabad	Shri Mohan Kumar Shri P. G. Choudhury (*Alternate*)
BOC India Ltd, Kolkata	Shri K. Manoharan Shri Ramana Vutukuru (*Alternate*)
Everest Kanto Cylinder Ltd, Mumbai	Shri P. M. Samvatsar Shri A. K. Khamkar (*Alternate*)
Hindustan Petroleum Corporation Ltd, Mumbai	Shri M. Selvakumar Shri Alok Kumar Gupta (*Alternate*)
Indian Oil Corporation Ltd, Mumbai	Shri Shankar Sharan Shri S. M. Rambhal (*Alternate*)
Indraprastha Gas Limited, Delhi	Shri Praveen K. Pandey Shri Ujwal Bhandari (*Alternate*)
International Industrial Gases Ltd, Kolkata	Shri Devendra K. Garg Shri Nikhilesh K. Garg (*Alternate*)
Kabsons Gas Equipments Ltd, Hyderabad	Shri Satish Kabra Shri S. GopalAiah (*Alternate*)
Kosan Industries Ltd, Mumbai/Surat	Shri S. K. Dey Shri S. B. Bomal (*Alternate*)
LPG Equipment Research Centre, Bangalore	Shri U. V. Mannur Shrimati Karobi Mukherjee (*Alternate*)
Mahanagar Gas Limited, Mumbai	Shri Raghunath Kulai Shri Arun Nayak (*Alternate*)
Maruti Koatsu Cylinders Ltd, Mumbai	Shri Nitin J. Thakkar Shri A. S. Saran (*Alternate*)
Ministry of Defence (DGQA), Pune	Shri J. P. Tiwari, JASG Shri K. Sudhakaran (*Alternate*)
Praxair India Ltd, Bangalore	Shri Milan Sarkar Shri Arindam Das (*Alternate*)
Research & Development Estt (Engineers), Pune	Shri P. K. Chattopadhyay Shri A. Basu (*Alternate*)
Sakha Engineers Pvt Ltd, New Delhi	Shri Amarjit S. Kohli
SICGIL India Ltd, Chennai	Shri Farooque Dadabhoy Shri R. Padmanaban (*Alternate*)
Society of Indian Automobile Manufacturers (SIAM), New Delhi	Shri K. K. Gandhi Shri Pankaj Kumar Karn (*Alternate*)
Steel Authority of India Ltd, Salem	Shri M. Prabakaran Shri N. K. Vijayavargia (*Alternate*)
Steel Authority of India Ltd, Ranchi	Shri Debashis Karmakar Dr B. K. Jha (*Alternate*)
Supreme Cylinders Ltd, Delhi	Shri M. L. Fathepuria
Tata Motors Ltd, Pune	Shri P. K. Banerjee Shri Amul Verma (*Alternate*)

Organization	*Representative(s)*
Tekno Valves, Kolkata	Shri Y. K. Behani Shri R. Behani (*Alternate*)
The Automotive Research Association of India, Pune	Dr S. S. Thipse Shri S. D. Rairikar (*Alternate*)
Trans Valves (India) Pvt Ltd, Hyderabad	Shri A. K. Jain Shri Anuj Jain (*Alternate*)
Vanaz Engineers Ltd, Pune	Shri S.R. Sarvate Shri S. J. Vispute (*Alternate*)
In personal capacity (*Menon & Patel, 14/1, Mile, Mathura Road, Faridabad*)	Shri Ebrahim M. Patel
In personal capacity (*303, Shantikunj, Pandav Bunglows Lane Athwalines, Surat*)	Shri L. D. Thakkar
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Member Secretary
Shri Vishal Tomer
Scientist 'C' (MED), BIS

Gas Cylinder Valves & Fittings Subcommittee, ME 16:1

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ACE LPG Car Kits Ltd, Thane	Shri Amit Shah Shri Manoj Vithalani (*Alternate*)
All India Gases Manufacturers Association, Vadodara	Shri Saket Tiku Shrimati Veena Peter (*Alternate*)
Batra Associates Limited, Faridabad	Shri N. K. Sawhney
Bharat Petroleum Corporation Ltd, Mumbai	Shri J. Vedagiri Shri Sanjay Phulli (*Alternate*)
Everest Kanto Cylinder Ltd, Mumbai	Shri P. M. Samvatsar Shri A. G. Khamkar (*Alternate*)
Hindustan Petroleum Corporation Ltd, Mumbai	Shri P. P. Nadkarni Shri Alok Kumar Gupta (*Alternate*)
Indian Oil Corporation Ltd, Mumbai	Shri Rabindra N. Ghosh Shri S. Rambhal (*Alternate*)
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Neema Forge Press Pvt Ltd, Nagpur	Shri G. L. Neema Shri Ajay Mirani (*Alternate*)
Petroleum and Explosive Safety Organization, Nagpur	Shri P. B. Yedla Shri D. K. Gupta (*Alternate*)
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Bureau of Indian Standards

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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